IN THE CLAIMS

The following is a complete listing of the claims. This listing replaces all earlier versions and listings of the claims.

Claims 1-14 (canceled)

Claim 15 (currently amended): A method of estimating an orientation angle of a local structure of a portion of ~~pattern in~~ an image, the portion of the image representing a region of the image having a substantially linear structure, said method comprising the steps of:

applying a complex energy operator to the portion of the image to provide an energy encoded image portion;

determining a phase component of [[said]] the energy encoded image portion; and

determining an estimation of the ~~calculating said~~ orientation angle of the local structure of the portion of the image from [[said]] the phase component of [[said]] the energy encoded image portion.

Claim 16 (currently amended): A method ~~as claimed in~~ according to claim 15, wherein [[said]] the complex energy operator is defined as[[:]]

$$\Psi_c\{f\} = \left(D\{f\}\right)^2 - fD^2\{f\},$$

and [[said]] the phase component of [[said]] the energy encoded image is defined as[[:]]

$$2\beta_0 = \arg\left(\Psi_c\{f\}\right).$$

Claim 17 (currently amended): A method ~~as claimed in~~ according to claim 15, wherein [[said]] the complex energy operator is a modified complex energy operator defined as[[:]]

$$\Psi_M\{f\} = \left(D_M\{f\}\right)^2 - fD_M^2\{f\},$$

and [[said]] the phase component of [[said]] the energy encoded image is defined as[[:]],

$$2\beta_0 = \arg\left(\Psi_M\{f\}\right).$$

Claim 18 (currently amended): A method ~~as claimed in~~ according to claim 15, wherein [[said]] the portion of the image is pre-processed to remove background offsets.

Claim 19 (currently amended): ~~Apparatus~~ An apparatus for estimating an orientation angle of a local structure of a portion of ~~pattern in~~ an image, said apparatus ~~comprises~~ comprising:

means for applying a complex energy operator to the portion of the image to provide an energy encoded image portion;

means for determining a phase component of [[said]] the energy encoded image portion; and

means for determining an estimation of the ~~calculating said~~

orientation angle from [[said]] the phase component of [[said]] the energy encoded image portion.

Claim 20 (currently amended): ~~Apparatus as claimed in~~ An apparatus according to claim 19, wherein [[said]] the complex energy operator is defined as[[:]]

$$\Psi_c\{f\} = \left(D\{f\}\right)^2 - fD^2\{f\},$$

and [[said]] the phase component of [[said]] the energy encoded image is defined as[[:]]

$$2\beta_0 = \arg\left(\Psi_c\{f\}\right).$$

Claim 21 (currently amended): ~~Apparatus as claimed in~~ An apparatus according to claim 19, wherein [[said]] the complex energy operator is a modified complex energy operator defined as[[:]]

$$\Psi_M\{f\} = \left(D_M\{f\}\right)^2 - fD_M^2\{f\},$$

and [[said]] the phase component of [[said]] the energy encoded image is defined as[[:]]

$$2\beta_0 = \arg\left(\Psi_M\{f\}\right).$$

Claim 22 (currently amended): ~~Apparatus as claimed in~~ An apparatus according to claim 19, ~~said apparatus~~ further comprising a means for pre-processing [[said]] the portion of the image to remove background offsets.

Claims 23-44 (canceled)

Claim 45 (new): A method of determining an orientation map representing estimates of orientation angles of an image at each of a plurality of points of the image, said method comprising the steps of:

applying a complex energy operator to portions of the image that correspond to the plurality of points of the image to provide energy encoded image values at each of the plurality or points;

determining a phase component for each of the energy encoded image values; and

determining the orientation map from the phase components.

Claim 46 (new): A method according to claim 45, wherein the complex energy operator is defined as

$$\Psi_c\{f\} = \left(D\{f\}\right)^2 - fD^2\{f\},$$

and the phase component of the energy encoded image is defined as

$$2\beta_0 = \arg\left(\Psi_c\{f\}\right).$$

Claim 47 (new): A method according to claim 45, wherein the complex energy operator is a modified complex energy operator defined as

$$\Psi_M\{f\} = \left(D_M\{f\}\right)^2 - fD_M^2\{f\},$$

and the phase component of the energy encoded image is defined as

$$2\beta_0 = \arg\left(\Psi_M\{f\}\right).$$

Claim 48 (new): An apparatus for determining an orientation map representing estimates of orientation angles of an image at each of a plurality of points of the image, said apparatus comprising:

means for applying a complex energy operator to portions of the image that correspond to the plurality of points of the image to provide energy encoded image values at each of the plurality of points;

means for determining a phase component for each of the energy encoded image values; and

means for determining the orientation map from the phase components.

Claim 49 (new): An apparatus according to claim 48, wherein the complex energy operator is defined as

$$\Psi_c\{f\} = \left(D\{f\}\right)^2 - fD^2\{f\},$$

and the phase component of the energy encoded image is defined as

$$2\beta_0 = \arg\left(\Psi_c\{f\}\right).$$

Claim 50 (new): An apparatus according to claim 48, wherein the complex energy operator is a modified complex energy operator defined as

$$\Psi_M\{f\} = \left(D_M\{f\}\right)^2 - fD_M^2\{f\},$$

and the phase component of the energy encoded image is defined as

$$2\beta_0 = \arg\left(\Psi_M\{f\}\right).$$